I claim:

1. An optoelectronic apparatus for detecting objects in a monitored region comprising:

a transmitter that emits transmission light that is guided into the monitored region, the emitted transmission light being in the form of a sequence of transmission light pulses;

means for coupling out a portion of the light quantity of a transmission light pulse as a reference transmission light pulse;

a receiver that receives reflected light including transmission light pulses reflected by an object in the monitored region and respective reference transmission light pulses which are guided by way of a reference path to the receiver; and

an evaluation unit connected to the transmitter and the receiver, said evaluation unit determining transit time t_o of the reflected transmission light pulse, and transit time t_R of the respective, reference transmission light pulse guided as a reference reflected light pulse to the receiver, wherein the transit-time difference $t_o - t_R$ is used to determine the distance of an object.

2. The optoelectronic apparatus according to claim 1, further comprising a diverting unit that periodically guides transmission light pulses into the monitored region.

3. The optoelectronic apparatus according to claim 2, wherein, for each diversion of a transmission light pulse by the diverting unit, a reference transmission light pulse is coupled out of the transmission light pulse being guided to the monitored region.

4. The optoelectronic apparatus according to claim 3, further comprising a housing having an exit window, the transmitter, the receiver and diverting unit being situated in the housing so that the transmission light pulses diverted at the diverting unit are guided into the monitored region by way of the exit window; and wherein the coupling-out means is a reflection surface disposed at the exit window, the reflection surface reflecting a portion of the light quantity of the transmission light pulses as a reference transmission light pulse back to the receiver.

5. The optoelectronic apparatus according to claim 4, wherein the reference transmission light pulses are guided entirely inside the housing.

6. The optoelectronic apparatus according to claim 1, further comprising a light waveguide disposed downstream of the transmitter wherein the reference transmission light pulses are coupled into the light waveguide and guided via the waveguide to the receiver.

7. The optoelectronic apparatus according to claim 6, wherein the reference transmission light pulses are guided entirely inside the housing.

8. The optoelectronic apparatus according to claim 1, wherein the evaluation unit determines the transit-time difference $t_o - t_R$ between the reflected transmission light pulse and the respective reference reflected light pulse by quantizing the amplitudes of an analog reflection signal appearing at the output of the receiver, the quantized sequence of reflection signals being read into the individual registers of a memory element at a predetermined rate, and the transit-time difference being determined as

the difference between the register positions of the reflected light pulse and the reference reflected light pulse.

9. The optoelectronic apparatus according to claim 8, further comprising a threshold-value unit that converts the analog reflection signals into a binary reflection-signal sequence.

10. The optoelectronic apparatus according to claim 8, further comprising an analog-digital converter having a word width of n bits that quantizes the analog reflection signals.

11. The optoelectronic apparatus according to claim 10, wherein the analog-digital converter has a word width of 8 bits.

12. The optoelectronic apparatus according to claim 10, wherein the evaluation unit determines the position of the maximum or the center of gravity of one of the quantized reflected light pulse and reference reflected light pulse in order to determine the register positions of

the reflected light pulse and the reference reflected light pulse.

13. The optoelectronic apparatus according to claim 8, wherein the memory element is formed by one of a semiconductor memory and a CCD array.

14. The optoelectronic apparatus according to claim 1, wherein the evaluation unit includes a time-measurement module for determining the transit-time difference $t_o - t_R$, where a reflected light pulse and the associated reference reflected light pulse are read into separate inputs of the time-measurement module.

15. The optoelectronic apparatus according to claim 14, wherein the inputs of the time-measurement module include a start input and a stop input.

16. The optoelectronic apparatus according to claim 1, wherein the apparatus is used as a safety apparatus in the field of personnel safety, and components of the evaluation unit for determining the transit-time difference $t_o - t_R$ have a single-channel design.